INDEX

DRYERS
TD70
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PROGRAM AND ELECTRICAL FEATURES TD 70 A

General design

TD 70 A have thermostat-controlled automatic programs to 47° C or 60° C and time programs up to 60 min.

Alternative connections
Alternative connections are single-phase, 230 V, 10 or 16 A with 1900 and 2850 W power respectively, 2-phase 400 V, 10 A, 2850 W (normal on delivery) 3-phase, 400 V, 10 A, 2850 W or 3-phase, 230 V, 16 A, 2850 W heating capacity.

Switching

Switching between the various alternative connections is made directly on the connection terminal board according to directions given.

Programs TD 70 A

The automatic programs can be started in setting 1 or 2. Setting 2 is more used, and gives drying to selected temperature, after which the program continues for about 14 minutes without any heat.
Setting 1 starts earlier in the program and has facility for reconnection of heat for better drying of small loads.
Program 3 is a time program with setting every 10 minutes. Program 4 is ventilation without heat, in practice the same as the end of the time program, approximately 14 minutes.

The program unit

The program unit has a mecanically marked setting points, motor with 4-min-stages and built-in buzzer.

Pushbuttons

The pushbuttons have the following functions:

S Start of program by means of starter relay

T Gives 47°C in pressed-in position and 60°C in released position

⏽ Main switch

Thermostats

There are four thermostats : The first is of 47°C and the second of 60°C, (for automatic programs) are fitted to the fan casing.
The third of 115°C (resets automatically) operates at 115°C switching out one of the heaters if the temperature rises excessively. The fourth thermostat, also fitted to the heater casing, operates at 150°C and provides protection against dangerous overheating. It must be manually reset.

The manual overheating protection breaks the contact to the starter relay, which means that the machine stops completely when there is overheating.

Signal lamp
The signal lamp indicates that the main switch is ”on”.

Driving motor
The driving motor is a bi-polar unit with direct-coupling fan and gear facility for driving the drum.

Capacitor
The capacitor is 8 uF mounted on the component bridge.

Heating element
The heating element with 1900 + 950 W output is the spiral type, located behind the drum.

Contactor and starter relay
The contactor and starter relay are located on the component bridge. The starter relay breaks contact when there is overheating and when the door is opened.

Door contact
The door contact is actuated by the door, and breaks the operating circuit.

Buzzer
The buzzer is installed in the program unit and gives two signals at end of program.

Internal cables
Internal cables are 0,75 or 1,5 mm^2 and 1,0 mm^2 for earth wire.

Connecting cables
The connecting cables shall be RKK or 5x1,5mm^2
Wiring diagrams
Wiring diagrams with timer diagrams and cable layout are incorporated in the machines.

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ELECTRICAL FEATURES TD 73A

General design
TD 73A is a vented dryer, which incorporate a microprocessor for process control, and pushbutton selection of programs. The pushbutton panel also carries LEDs and two-digit 7-segments displays which indicate selected time (for times programs), time-delayed starts etc.

Electrical supply
The machines are supplied as 3-phase, 230V, 10A, heater power 2620W. They can also be reconnected internally to suit them for a single-phase, heater power 2620W, 16A or single-phase. Heater power 1900W, 10A.

Programcontrol
Control unit
The control unit has a microprocessor for control of the motor, heater, program etc.

Keyboard
The keyboard includes pushbuttons and indicators.

Main On/Off switch
The main On/Off switch is fitted in the centre of the lower edge of the panel, is a 2-pole switch and disconnects the phase and the zero-line.

Indicating lamp
The indicating lamp shows that the main switch is turned on.

Door switch
The door operates a door-switch that, when open, interrups the program. If the door has been opened while the machine is running, and then closed again, the machine must be restarted by the Start pushbutton.

Drive motor
The main drive motor is at the bottom of the machine, driving the drum and the two fans that circulate internal air and external air.

Heater
TD 73 A: The maximum heating power is 2620W provided by two heaters with ratings of 1900W and 720W respectively, so that the machine can be reconnected to provide a reduced heating power of 1900W.

Overheating cutout
The machine incorporates a manually-resettable overheating cutout, operating at a temperature of 150°C.

Thermostat
The thermostat has an automatic reset and the breaking temperature is of 115°C. It is used for indication of fluff in the filter or in the condenser. See fault signals F4. Not all markets.

Capacitor
The drive motor capacitor is of 8µF.

Buzzer
A built-in buzzer is fitted so that the end of the program can be indicated audibly if required.

Lighting
An interior drum light is fitted and is operated by the door switch.

Temperature sensing
Machine temperature is controlled by a thermistor for exact control. If the thermistor is loose or gets a short circuit, the program is stopped. See fault signal F3.

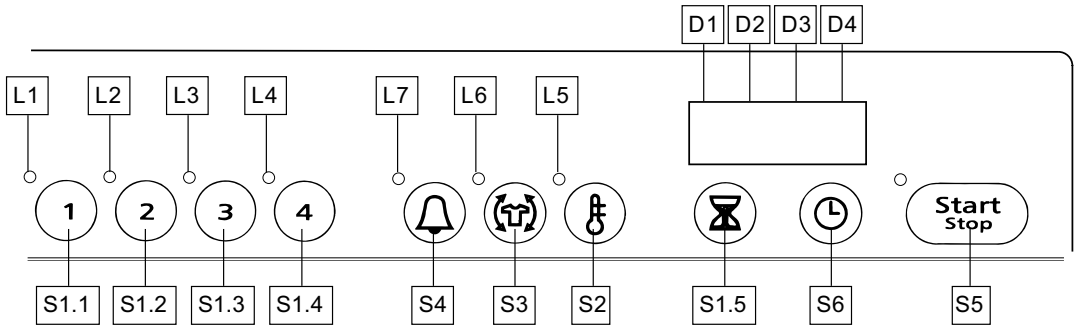
Moisture sensing
A moisture sensor, measuring the humidity of the circulating air, controls the drying process. The output from the sensor should be between 1-16 mV DC when the machine is running. Other values from the sensor will stop the program. See fault signal F5.

Interference suppression
The machine incorporates two RFI suppressors.

Starting relay
A relay mounted on the electrical components platform interrupts the power a) if the machine overheats, b) if the door is opened or c) at the end of a program.

Mains cable
The mains cable is an RKK 3x1,5 or 5x1,5 mm^2, with variants for different markets.

Maximum operating time
In order to prevent the dryer from operating indefinitely (for whatever reason), the maximum running time is 180 minutes, after which the program is interrupted.See fault signal F2.



Program

S1.1- S1.4 Automatic programs

In this program the drying time is controlled by the microprocessor, depending on the moisture level measured by the moisture sensor and the dryness of the chosen program. The temperature is controlled by the thermistor to 60°C.
By very small loads or empty machine, these programs will use a drying time of about 20 minutes.

S1.1 Extra dry
S1.2 Normal dry 1
S1.3 Normal dry 2
S1.4 Iron dry

The programs are ended by a cooling-down sequence, which goes on till the air temperature is ca 40°C or for a maximum time of 15 min. D2 indicates ”C” during the cooldown period.

S1.5 Timed program

One press on S1.5 means 5 min. drying time + cool down till the air temperature is 40°C or maximum 15 minutes.
Continued pressings increases the drying time to 10, 15, 20, 30, 50, 60, 70, 80, 90, C (just cool air 15 min.), 5, 10 etc.
Drying temperature 53°C.
D1 and D2 indicates drying time in minutes. After starting the machine counts down with 1 for each minute. Cool down sequence is indicated with ”C”.

S2 Low temperature

Lowers the temperature in program S1.1-Sl.4 from 60°C to 53°C.
S2 is automatically activated in program S1.5.

S3 Intermittent action

Means that the motor rotates for 3 seconds every minute during one hour after end of program.

S4 Buzzer

A buzzer tone of 3 seconds (ca 65 dBA) indicates end of program.

S5 Start/Stop
Start a program by pressing the button and stop by pressing it for 3 seconds.

S6 Time delayed start
The start of a program can be delayed for 1-12 hours. Push the button so many times that you want the start to be delayed. By thirteenth press, the delay will be zero. D3 and D4 indicate the chosen amount of hours.

Test program
Through pressing S1.1 5 times and S1.2 for 5 times, you get into a test program.

A press on	S1.2 will lit	L1-L4 and	D1-D2
”	S1.3 ”	L5-L8 ”	D3-D4
”	S4 The buzzer is activated		

There will be a heating up till 53° C. After that the heater, low effect, is turned off. The heating-up continues to 60°C and then all components are shut off. During the heating-up the moisture in the machine is indicated by D1 and D2 (normally 3-13). D3 and D4 indicate the temperature.

Fault signals:
The following codes are indicated by D3 and D4.

F2	Maximal drying time, 3 hours
F3	Thermistor fault
F4	Fluff in the fluff filter or in the condenser (indicated after end of program)
F5	Fault in the moisture sensor

Reasons for faults

Open-circuited or short-circuited thermistor
This will interrupt the program and produce a flashing F3 on the display. An open circuit can be caused by a broken connection or a faulty thermistor. The resistance of a helthy thermistor is between 60 kohm and 40 kohm at 20-30°C.

Thermistor not in thermal contact with the fan casing
The heating element will be energised as long as the thermistor does not sense the air temperature called for by the program, resulting in excessive air temperature.

Filter clogged
The overheating cutout (150°C) will operate, and the machine stops.Must be reset manually.

Moisture sensor not installed in the fan casing or fault in the control unit
The machine stops after ca 20 min.

Incoming supply fuses blown
Fuse L1 blown: Machine will stop after ca. 20 minutes. Heater power will be reduced (720W)
Fuse L2 blown:The machine will not start. Main power On light extinguished.
Fuse L3 blown: Machine operates, but with extended running time (low heater power 1900W).

380V between phase and neutral
The fan motor will stop after a few seconds. The overheating cutout will operate, but the heater and controls will be destroyed.

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PROGRAM AND ELECTRICAL FEATURES TD 76 A

General design
TD 76 A has thermostat-controlled automatic programs to 47° C or 60° C and time programs up to 60 min.

Alternative connections
Alternative connections are single-phase, 230 V, 10 or 16 A with 1900 and 2850 W power respectively, 2-phase 400 V, 10 A, 2850 W (normal on delivery) 3-phase, 400 V, 10 A, 2850 W or 3-phase, 230 V, 16 A, 2850 W heating capacity.

Switching
Switching between the various alternative connections is made directly on the connection terminal board according to directions given.

Programs TD 76A
The program is a time program with marking every 20 minutes. The drying is terminated by a cool-down period of 12 minutes. You can set this sequence directly and to get an airing program.

The program unit
The program unit has a mecanically marked setting points, motor with 4-min-stages and built-in buzzer.

Pushbuttons
The pushbuttons have the following functions:

S Start of program by means of starter relay

T Gives 47°C in pressed-in position and 70°C in released position

Thermostats

There are four thermostats : The first is of 47°C and the second of 70°C, are fitted to the fan casing.
The third of 115°C (resets automatically) operates at 115°C switching out one of the heaters if the temperature rises excessively. The fourth thermostat, also fitted to the heater casing, operates at 150°C and provides protection against dangerous overheating. It must be manually reset.

The manual overheating protection breaks the contact to the starter relay, which means that the machine stops completely when there is overheating.

Signal lamp
The signal lamp indicates that the main switch is ”on”.

Driving motor
The driving motor is a bi-polar unit with direct-coupling fan and gear facility for driving the drum.

Capacitor
The capacitor is 8 uF mounted on the component bridge.

Heating element
The heating element with 1900 + 950 W output is the spiral type.

Contactor and starter relay
The contactor and starter relay are located on the component bridge. The starter relay breaks contact when there is overheating and when the door is opened.

Door contact
The door contact is activated by the door, and breaks the operating circuit.

Condensate water pump
There is a pump in the machine to pump water from the lower container to a container in the panel.

Overflow protection
If both the water containers become full, a level switch on the lower container stops the program. It is controlled by a micro switch fitted on the lower container.

Internal cables
Internal cables are 0,75 or 1,5 mm^2 and 1,0 mm^2 for earth wire.

Connecting cables
The connecting cables shall be RKK 3, 4 or 5x1,5mm^2

Wiring diagrams
Wiring diagrams with timer diagrams and cable layout are incorporated in the machines.

ELECTRICAL FEATURES TD 77A

General design
TD 77A is a condensing tumble dryer , which incorporate a microprocessor for process control, and pushbutton selection of programs. The pushbutton panel also carries LEDs and two-digit 7-segments displays which indicate selected time (for times programs), time-delayed starts etc.

Electrical supply
The machines are supplied as 3-phase, 230V, 10A, heater power 2850W . They can also be reconnected internally to suit them for a single-phase, heater power 2850W , 16A or single-phase. Heater power 1900W, 10A.

Programcontrol
Control unit
The control unit has a microprocessor for control of the motor, heater, program etc.

Keyboard
The keyboard includes pushbuttons and indicators.

Main On/Off switch
The main On/Off switch is fitted in the centre of the lower edge of the panel, is a 2-pole switch and disconnects the phase and the zero-line.

Indicating lamp
The indicating lamp shows that the main switch is turned on.

Door switch
The door operates a door-switch that, when open, interrups the program. If the door has been opened while the machine is running, and then closed again, the machine must be restarted by the Start pushbutton.

Drive motor
The main drive motor is at the bottom of the machine, driving the drum and the two fans that circulate internal air and external air.

Condensate pump
The machine includes a pump to pump condensated water from the lower container to an upper container behind the control panel.

Heater
TD 77 A: The maximum heating power is 2850W provided by two heaters with ratings of 1900W and 950W respectively, so that the machine can be reconnected to provide a reduced heating power of 1900W.

Overheating cutout
The machine incorporates a manually-resettable overheating cutout, operating at a temperature of 150°C.

Thermostat
The thermostat has an automatic reset and the breaking temperature is of 115°C. It is used for indication of fluff in the filter or in the condenser. See fault signals F4. Not all markets.

Capacitor
The drive motor capacitor is of 8µF.

Buzzer
A built-in buzzer is fitted so that the end of the program can be indicated audibly if required.

Lighting
An interior drum light is fitted and is operated by the door switch.

Overflow protection
If both the water containers become full, a level switch on the lower container stops the program and indicates on the display. It is controlled by a micro switch fitted on the lower container. See fault signal F1.

Temperature sensing
Machine temperature is controlled by a thermistor for exact control. If the thermistor is loose or gets a short circuit, the program is stopped. See fault signal F3.

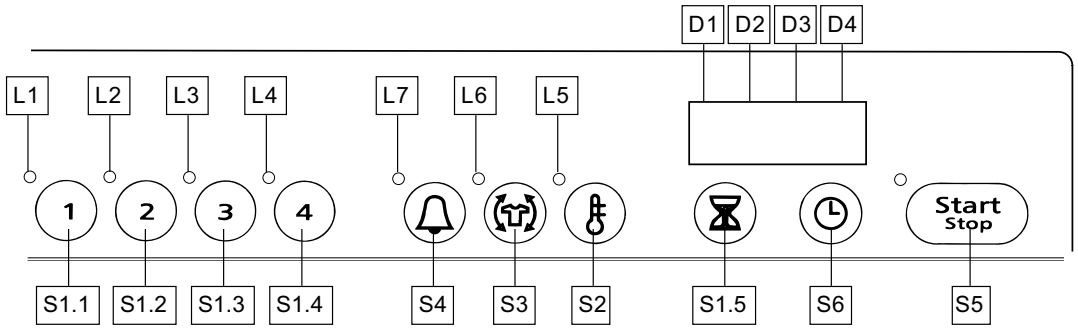
Moisture sensing
A moisture sensor, measuring the humidity of the circulating air, controls the drying process. The output from the sensor should be between 1-16 mV DC when the machine is running. Other values from the sensor will stop the program. See fault signal F5.

Interference suppression
The machine incorporates two RFI suppressors.

Starting relay
A relay mounted on the electrical components platform interrupts the power a) if the machine overheats, b) if the door is opened or c) at the end of a program.

Mains cable
The mains cable is an RKK 3x1,5 or 5x1,5 mm^2, with variants for different markets.

Maximum operating time
In order to prevent the dryer from operating indefinitely (for whatever reason), the maximum running time is 180 minutes, after which the program is interrupted.See fault signal F2.



Program

S1.1- S1.4 Automatic programs

In this program the drying time is controlled by the microprocessor, depending on the moisture level measured by the moisture sensor and the dryness of the chosen program. The temperature is controlled by the thermistor to 75°C.
By very small loads or empty machine, these programs will use a drying time of about 20 minutes.

S1.1 Extra dry
S1.2 Normal dry 1
S1.3 Normal dry 2
S1.4 Iron dry

The programs are ended by a cooling-down sequence, which goes on till the air temperature is ca 35°C or for a maximum time of 15 min. D2 indicates ”C” during the cooldown period.

S1.5 Timed program

One press on S1.5 means 5 min. drying time + cool down till the air temperature is 35°C or maximum 15 minutes.
Continued pressings increases the drying time to 10, 15, 20, 30, 50, 60, 70, 80, 90, C (just cool air 15 min.), 5, 10 etc.
Drying temperature 50°C.
D1 and D2 indicates drying time in minutes. After starting the machine counts down with 1 for each minute. Cool down sequence is indicated with ”C”.

S2 Low temperature

Lowers the temperature in program S1.1-Sl.4 from 75°C to 50°C .
S2 is automatically activated in program S1.5.

S3 Intermittent action

Means that the motor rotates for 3 seconds every minute during one hour after end of program.

S4 Buzzer

A buzzer tone of 3 seconds (ca 65 dBA) indicates end of program.

S5 Start/Stop
Start a program by pressing the button and stop by pressing it for 3 seconds.

S6 Time delayed start
The start of a program can be delayed for 1-12 hours. Push the button so many times that you want the start to be delayed. By thirteenth press, the delay will be zero. D3 and D4 indicate the chosen amount of hours.

Test program

Through pressing S1.1 5 times and S1.2 for 5 times, you get into a test program.

A press on	S1.2 will lit	L1-L4 and	D1-D2
”	S1.3 ”	L5-L8 ”	D3-D4
”	S4 The buzzer is activated		
”	S1.4 starts the motor,heater, high effect, heater low effect, and outlet pump .		

There will be a heating up till 50° C . After that the heater, low effect, is turned off. The heating-up continues to 60°C and then all components are shut off.
During the heating-up the moisture in the machine is indicated by D1 and D2 (normally 3-13). D3 and D4 indicate the temperature.

Fault signals:
The following codes are indicated by D3 and D4.

F1	Overfilling in the condensate water container
F2	Maximal drying time, 3 hours
F3	Thermistor fault
F4	Fluff in the fluff filter or in the condenser (indicated after end of program)
F5	Fault in the moisture sensor

Reasons for faults

Open-circuited or short-circuited thermistor
This will interrupt the program and produce a flashing F3 on the display. An open circuit can be caused by a broken connection or a faulty thermistor. The resistance of a helthy thermistor is between 60 kohm and 40 kohm at 20-30°C.

Thermistor not in thermal contact with the fan casing
The heating element will be energised as long as the thermistor does not sense the air temperature called for by the program, resulting in excessive air temperature.

Filter clogged
The overheating cutout (150°C) will operate, and the machine stops.Must be reset manually.

Moisture sensor not installed in the fan casing or fault in the control unit
The machine stops after ca 20 min.

Incoming supply fuses blown
Fuse L1 blown: Machine will stop after ca. 20 minutes. Heater power will be reduced (950W)
Fuse L2 blown:The machine will not start. Main power On light extinguished.
Fuse L3 blown: Machine operates, but with extended running time (low heater power 1900W).

380V between phase and neutral
The fan motor will stop after a few seconds. The overheating cutout will operate, but the heater and controls will be destroyed.